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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,730	10/19/2001	Michael Collins	00-682	4112

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EXAMINER	
LIU, HAN L	
ART UNIT	PAPER NUMBER
3746	5

DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/028,730	COLLINS ET AL.	
	Examiner	Art Unit	
	Han Lieh Liu	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Amendment received on 05/06/2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 October 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Receipt is acknowledged of papers submitted for "Amendment Under 37 C.F.R. §1.111" on 05/06/203. This amendment amends claims 1, 4, 14, 17, 20, 24 and 29. Amendment papers have been placed of record in the file. The amended claims are examined in this office action.

Response to Arguments

2. Applicant's arguments with respect to claims 1 - 34 have been considered but are not persuasive in view of the new ground(s) of rejection. This amendment is non-final to afford the applicant the opportunity to respond to the new ground of rejection.

Drawings

3. The drawings filed on 10/19/2001 are acceptable subject to correction of the informalities indicated on the attached "Notice of Draftperson's Patent Drawing Review," PTO-948. In order to avoid abandonment of this application, correction is required in reply to the Office action. The correction will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 – 3, 17 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Hahn et al. (USPN 6406265 B1).

Hahn et al. disclose an apparatus for monitoring a compressor comprising: a plurality of sensor inputs (discharge temperature and pressure: 30 and 32, suction temperature and pressure: 36 and 38, motor control 40, sump temperature 42, power input to motor: 44 and 46) for receiving input regarding operating parameters of a compressor (20), column 2 lines 47 – 65; at least one control action output (48 and/or 50) for sending a control action to said compressor, column 3 lines 3 – 12; a control member (26) communicated with said plurality of sensor inputs and said control action output, said control member being adapted to analyze input from said plurality of sensor inputs, to determine a control action based upon said input and to send control action to said at least one control action output, column 3 lines 7 – 12, wherein said control action includes actions for immediate protection by stopping the motor or a signal is issued to a warning light (52) while said compressor is continued to be operated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 6 – 10, 16, 18, 19, 21, 22, 23, 25 – 28 and 30 – 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hahn et al. (USPN 6406265 B1) as applied to claim 1 above, and further in view of Kauffman et al. (USPN 5209076).

With regard to claims 6 – 8, 18, 19, 21, 23, 25 – 28 and 30 – 33, Hahn et al. disclose the invention substantially as claimed in base claim 1. Hahn et al., however, do not specifically disclose that the control member is at a remote location and communicates with communication member and a display member. Kauffman et al. disclose an apparatus for monitoring a compressor, column 1 line 57 to column 2 line 58, comprising: a plurality of inputs, compressor suction temperature (40) and pressure (42), compressor discharge temperature (48) and pressure (46), oil pressure (44), monitor control device (38, detailed in Fig. 2), electrical control panel (52); control output to printer (56) and to compressor as indicated in Fig. 1; control device (38) with microprocessor (60) communicating with sensors (40, 42, 44, 46 and 48) through analog to digital converter (90), keyboard manual inputs, real time clock interface (76), alarm interface (92), memory interface (80) and reset interface (102); display module (64) for a remote computer screen, column 5 lines 29 – 34; analyzing and comparing inputs for control actions, column 5 line 3 to column 6 line 9. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made for a microprocessor-based control process to advantageously have microprocessor, equipped with predetermined operational parameters for controls, and located remotely in a clean environment so that it will not be contaminated and the system further equipped with a display means for operator's attention as illustrated by Kauffman et al.

With regard to claims 9, 10 and 16, Kauffman et al. disclose the invention substantially as claimed in base claim. Furthermore, Kauffman et al. disclose the condition of "floodback" in column 1 lines 24 – 28 and 43 – 54. The actual superheat is computed from the sensor measurement and the compressor is automatically shut off and alarm signals are generated to indicate the presence of problem conditions, column 1 line 64 – column 2 line 6.

Claim 22 is rejected because of defected base claim 17.

6. Claims 4, 5, 20, 29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hahn et al. (USPN 6406265 B1) as applied to base claim 1 above and further in view of Allison et al. (USPN 5772403).

Hahn et al. disclose the invention substantially as claimed in base claim 1. Hahn et al., however, do not specifically disclose the commands for indicating that maintenance is needed. Allison et al. disclose that a control system, for monitoring operation of a pump including a microprocessor-based controller and a plurality of sensors, can accurately determine the next scheduled maintenance should occur, column 9 line 66 to column 10 line 5. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made for a microprocessor-based control process to advantageously record each type of fault signals in the computer memory for determining the next scheduled maintenance as taught by Allison et al.

7. Claims 11 – 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hahn et al. (USPN 6406265 B1) as applied in claim 1 above and further in view of Pham et al. (USPN 6318101 B1).

Hahn et al. disclose the invention substantially as claimed in base claim 1. Hahn et al., however, do not specifically disclose a liquid slugging condition. Pham et al. teach that the liquid slugging condition is a function of discharge superheat, column 2 lines 11 – 18. Hahn et al. monitor the compressor discharge temperature. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made for a microprocessor-based control process with temperature sensors to monitor the compressor discharge temperature and to determine the discharge superheat for preventing liquid slugging condition as indicated by Pham et al.

8. Claims 13 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hahn et al. (USPN 6406265 B1) as applied to claim 1 above and further in view of Williams et al. (USPN 5946925).

Hahn et al. disclose the invention substantially as claimed in base claim 1. Hahn et al., however, do not specifically disclose a liquid injection valve on the compressor system. Williams et al. teach that using a liquid injection valve (36) in parallel to the solenoid valve (32) to avoid refrigerant condensate from accumulation in front of the valve and the cause of it is due to the pre-selected temperature threshold of the thermal process, column 5 lines 18 – 23 and 43 – 50 and Fig. 1. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made for a microprocessor-based control process to advantageously include a liquid injection valve to be controlled by the microprocessor in concert with the temperature sensor, which monitors the compressor discharge temperature, for preventing the accumulation of refrigerant liquid in front of the solenoid valve.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Gaston (USPN 4594051), and Kono et al. (USPN 4328678).

Gaston discloses a system, apparatus and method for detecting and controlling surge in a turbo compressor by providing warnings and control actions before the individual and cumulative stresses of repetitive surge cycles damage the compressor. Further, it provides a warning signal or compressor shut down based upon the number, intensity and duration of the surges, not just the number of them.

Kono et al. disclose a protecting device for protecting a refrigerant compressor from overheating or seizure caused by a shortage of refrigerant by any chance such as leakage thereof. The device includes a temperature sensor disposed on the outer wall of the compressor casing in the vicinity of a refrigerant intake suction port for sensing the temperature of the outer wall to output the sensed or measured data and a discriminator for discriminating an occurrence of refrigerant shortage by an excess of the data over a predetermined condition for comparison. The signals from the discriminator cause a warning issuance of the refrigerant shortage or an automatic stoppage of the compressor operation.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Han Lieh Liu whose telephone number is 703-305-0860. The examiner can normally be reached on Monday - Thursday 7:30 to 16:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on 703-308-0102. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0861.

Han Lieh Liu
June 25, 2003